Science News-Letter

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ETHNOLOGY

Doll Family Traced to Stone Age "Adam"

By Emily C. Davis

The "Adam" of the doll tribe was a woman, a fat, round little image of a woman carved out industriously by a cave man artist, some 30,000 years ago.

This announcement has just been made, in more technical language, before a meeting of anthropologists, by Dr. Walter Hough, noted anthropologist of the U. S. National Museum. It means that the ancestry of the smiling unbreakable doll of the modern toy shop has now been carried back generations beyond the oldest dolls loved by Greek and Egyptian children, back into prehistoric times. It means that the evolution of the doll has been traced to times and places before it had become a harmless toy for little girls.

Dr. Hough set out not long ago to write a short history of dolls, because Dr. S. P. Langley, former director of the Smithsonian Institution, had once told another scientist that such an account ought to be written.

"I always wondered why this other man never did follow Dr. Langley's suggestion," said Dr. Hough in a recent interview. "But when I got into the subject only a little way I found out. The history of dolls is most complex. A quest for light on the use and meaning of the doll quickly leads back and away from childish toys into the dark world of cult and religion where dolls were idols; and back again to images and charms used as tools by sorcerers, to fetishes, household gods, and objects of witchcraft.'"

In these lowest levels of human culture, Dr. Hough found only remote ancestors of the doll family, as different from modern dolls as prehistoric men were different from modern Americans.

Children in these very primitive tribes, both past and present, would not normally play with dolls at all, Dr. Hough says. And with this significant statement, he sweeps away the pleasing picture of the cave man's child crooning over a long rock tied up in a bit of reindeer skin.

DR. HOUGH studies magic images made by American Indians before the days of Columbus.

Now, we think of dolls and little girls together as naturally as we associate barking with a dog. It would be hard for most of us to think of any outpost of the world where the children do not lavish affection on toy babies, however crude. Dr. Hough himself says that it is rather natural to infer that all races would have a feeling leading them to give dolls to their babies. It seems reasonable that children of all times and races would demand them. But the real evidence of the matter as he pieces it together, indicates that a deeply rooted feeling of quite a different sort causes primitive men to make images and to restrict use of these images rigidly.

This is the feeling of fear associated with supernatural things. Almost as soon as men began to reason and speak, Dr. Hough explained, they began to try to control nature, more or less as they would force another human being to do their will. The most powerful and resourceful men of the group claimed to have special influence with nature. They knew the best ways of making rainfall and of controlling disease and of finding game in the forest. They became magicians and medicine men, the oldest professional class in the history of human society.

Exactly how far back men began to attempt to manage nature is not known, but the oldest tangible evidences are the first carved human images made by man. These are the small female figures which date back to the Aurignacian period of the Old Stone Age, and which are known as Stone Age Venuses. A large number of these little stone and ivory figurines have been found at places where prehistoric cave dwellers lived in different parts of Europe. The oldest of them all, perhaps, is a headless torso of a female figure found at Brassempouy, in France.

Images came to be used quite naturally in the making of magic," Dr. Hough continued. "Early man's first idea of supernatural things seems to have been that life extended into the world at certain points. Particular trees, stones, and other objects were saturated, so to speak, with life. The clever medicine men caught this power or some spirit that could do marvelous things, and transferred it to a charm or fetish. And of all the objects most suitable for holding magic power obviously a human figure of some sort was the best.

"The mystery of death, which must have puzzled the earliest thinkers, was directly conducive to the development of human images. Man very early saw that at death something traveled from the chief center of life, the human body, and went to some other

(Just turn the page)

INDEX TO THIS ISSUE

CLASS STUDY HELPS

Articles on following pages will be found especially useful in science class work:

Dolls

(*Continued from page* 93)

place or status. The most satisfactory explanation contrived was that the ghost or spirit went to some particular object or place. So there arose a multitude of rites concerning the departure of the spirit from the body and rites concerning the powers and influences and existence of the ghost. Little human figures, made and controlled by the medicine man, held the life power released by the dead tribesmen, and used it for good or evil as the magician directed.

"It can now be seen why dolls in such communities are for powerful men and not for children. An object set apart by some incantation and made to contain more fully the unseen power of the essence of nature is dangerous, not to be seen or touched except by the initiated. When these ideas are current among lower races, no one would allow a child to possess any image of human or animal form, as such things are forbidden or tabooed under heavy penalty. The children must amuse themselves in other ways."

There are very many examples, Dr. Hough explained, which show the impressive and dangerous properties of images as they are used by primitive tribes, past and present.

In West African tribes, where diseases are brought by spirits, a doctor's task is to transfer the disease carrying spirit away from the patient to some object or other person. One approved way of doing this is to lure the spirit of the disease into a model of the patient made of clay. The clay image is then left by a road where people will pass, and disease and spirit go into the body of the first unfortunate person who happens to come along.

Islanders of the East Indies also use images to deceive a demon that has brought a disease. The method

(*Continued on page* 97)

News-Letter Features

Born over four years ago of the demand and interest of those individuals who had caught a glimpse of *Science Service's* news reports to newspapers, the SCIENCE NEWS-LETTER has since proved interesting to laymen, scientists, students, teachers and children.

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EVOLUTION

Flat Earth and Anti-Evolution

Children in North Carolina will be compelled to learn that they live on a flat earth located in the center of the universe, the kind of a world people believed in a thousand years ago, if the state legislature passes a proposed anti-evolution bill. According to opponents of the measure, this will be its effect, for although such teaching is not specifically commanded, all instruction concerning the origin and nature not only of man but of other living creatures and inanimate matter as well must be forced to conform literally to the words of the Old Testament.

Here is just what the bill says on the subject:

"The General Assembly of North Carolina do enact:

"Section 1: That it shall be unlawful for any professor, teacher or instructor, to teach in any school, college, or educational institution within the State of North Carolina, receiving aid from the State, any doctrine or theory of evolution, which contradicts or denies the divine origin of man or of the universe, as taught in the Holy Bible."

"Provided, however, that nothing in this act shall be construed to prohibit the teaching in said schools, colleges or educational institutions of all useful arts and sciences, *unless the same are taught in such a manner as to contradict the fundamental truths of the Holy Bible.*" This bill strikes deep and wide into the field of science. For example, no presentation of the planetesimal theory of the origin of the solar system and the new theories concerning the origin of matter would be permitted under such a law.

The assembling of state legislatures recently has produced a number of anti-evolution bills. In Missouri, a bill, defeated shortly after introduction, provided: "It shall be unlawful to teach any theory or hypothesis in regard to the origin of life on this planet that is not in harmony with the Divine account of Creation as set forth in the first and second chapters of Genesis in the Holy Bible or to teach that man has descended from the lower animals in any educational institution that is supported wholly or in part by state money * * *."

The anti-evolution bill before the South Carolina house of representatives follows closely the wording of the Tennessee act under which the Scopes trial was held. If it should be passed, a teacher convicted under its provisions would have to move

(*Just turn the page*)

ASTRONOMY

HENRY NORRIS RUSSELL

Stellar Evolutionist

"Russell is the sort of a man who would attain distinction in any field, so it's fortunate for astronomy that he made the choice he did."

With these words one of his contemporaries, himself the distinguished professor of astronomy at another university, aptly characterized Dr. Russell, professor of astronomy at Princeton, and director of the Halsted Observatory there. To one who has had the pleasure of listening to him discourse on Italian literature, for instance, or some other subject remotely removed from astronomy, its force is evident.

But it was astronomy that he chose while yet a student at Princeton, and it is in this field that he has achieved an international reputation, bringing him, among many honors, the foreign associateship of the Royal Astronomical Society, as well as its gold medal, the Henry Draper Medal of the National Academy of Sciences and the Lalande Medal of the French Academy. His contributions have included important researches on the theory of spectra, of profound importance to the physicist as well as the astronomer. It is his theory of the evolution of stars, now very generally accepted, for which he is chiefly known, however.

Born at Oyster Bay, N. Y., October 25, 1877, Dr. Russell graduated from Princeton, where he had studied under Prof. C. A. Young, and took his Ph.D. there in 1900. After a few years at

(*Just turn the page*)

HYGIENE

Death From Live Fishes

Many a gullible mortal has swallowed a fish story, but how many have ever swallowed a live fish? Dr. E. W. Gudger, associate in ichthyology in the American Museum of Natural History, has recently published a collection of accounts, dating back to 1567, of live fishes lost in the food and air passages of man.

On the coasts of France and Italy and in India and the Far East, says Dr. Gudger, fishermen are accustomed to take live fishes between their teeth either to kill them by biting, or to hold them while the hands are used to free the hook or net. A fish so held, if it pricks the lips with its spines or makes a sudden wriggle, readily causes the man to open his mouth into which the fish is very likely to jump still further.

Most of the accounts show, continued Dr. Gudger, that the fish most often lodge in the pharynx where the spines, fins and gills make it impossible to pull them out without lacerating the throat. Death usually follows from suffocation unless an operation can be performed to open the trachea and remove the offender quickly. The consequences are somewwhat less serious though not less unpleasant when a fish finds its way into the esophagus, according to Dr. Gudger's data.

Science News-Letter, February 12, 1927

HORTICULTURE

Two Plants: Same Disease

The same virus or invisible germ, undetectable even with the highest powers of the microscope, that causes the blight disease is also to blame for the curly-top disease of sugar beats, and is borne back and forth between these very dissimilar plants by an inconspicuous little insct known as a leaf-hopper. The identity of the two diseases and the part played in their transmission by the leaf-hopper have been demonstrated by Prof. M. B. McKay and T. P. Dykstra of the Oregon Experiment Station.

After observing the coincident occurrence of curly-top in beet fields and of the blight in neighboring crops of tomatoes, the two investigators caged healthy tomato plants in an insect-proof greenhouse, and allowed leaf-hoppers captured in a field of diseased beets to feed upon them. After two or three weeks the tomatoes developed typical symptoms of their disease, and thus confirmed the suspicion entertained of the activities of insects.

Science News-Letter, February 12, 1927

Stellar Evolutionist

(*Continued from page* 95)

Cambridge University, England, he returned to his *alma mater* as an instructor in 1905, becoming professor in 1911 and director of the observatory in 1912, posts which he still holds. In 1921 he was also appointed as research associate of the Mt. Wilson Observatory in California, where he now spends part of his time each year.

Science News-Letter, February 12, 1927

Congo elephants are particularly fond of bananas.

Primitive African tribes made beads out of ostrich egg-shells.

Almost every kind of warm blooded animal is pestered by some kind of flea.

Last year the United States imported 310,000 canaries and almost 54,000 parrots.

Planting black walnut trees in good soil is a good investment, the Forest Service says.

Production of rose oil is being attempted in Greek Macedonia by refugees from Bulgaria.

Spitzbergen, which today is a synonym for frigid climate, once had weather like pleasant France.

Butterflies cannot claim membership in the fly family because they have four wings instead of two.

A method of mixing concrete, developed at Ohio State University, is said to increase the strength 115 per cent.

A motorist traveling 30 miles an hour could drive for three years and 16 days over American highways without seeing the same milepost twice.

Many of the rats on farms are found to migrate there from the cities, in shipments of dairy and poultry feed.

After every great war in which mothers and children have been under-fed there has been rickets among the babies.

Halley's comet appeared in 1066 A. D., shortly before the Norman conquest in England, and a tapestry records the alarm it caused among King Harold's subjects.

Anti-Evolution

(*Continued on page* 93)

from the state, or else change his profession, for the bill has the drastic provision that: "Any teacher violating the provisions of this Act shall forfeit all pay due, or to become due, and shall be forever barred from further teaching in any University, State College or other public school of this State."

The anti-evolution bill introduced into the Alabama house of representatives is similar in wording to the anti-evolution act that became a Tennessee law in 1925.

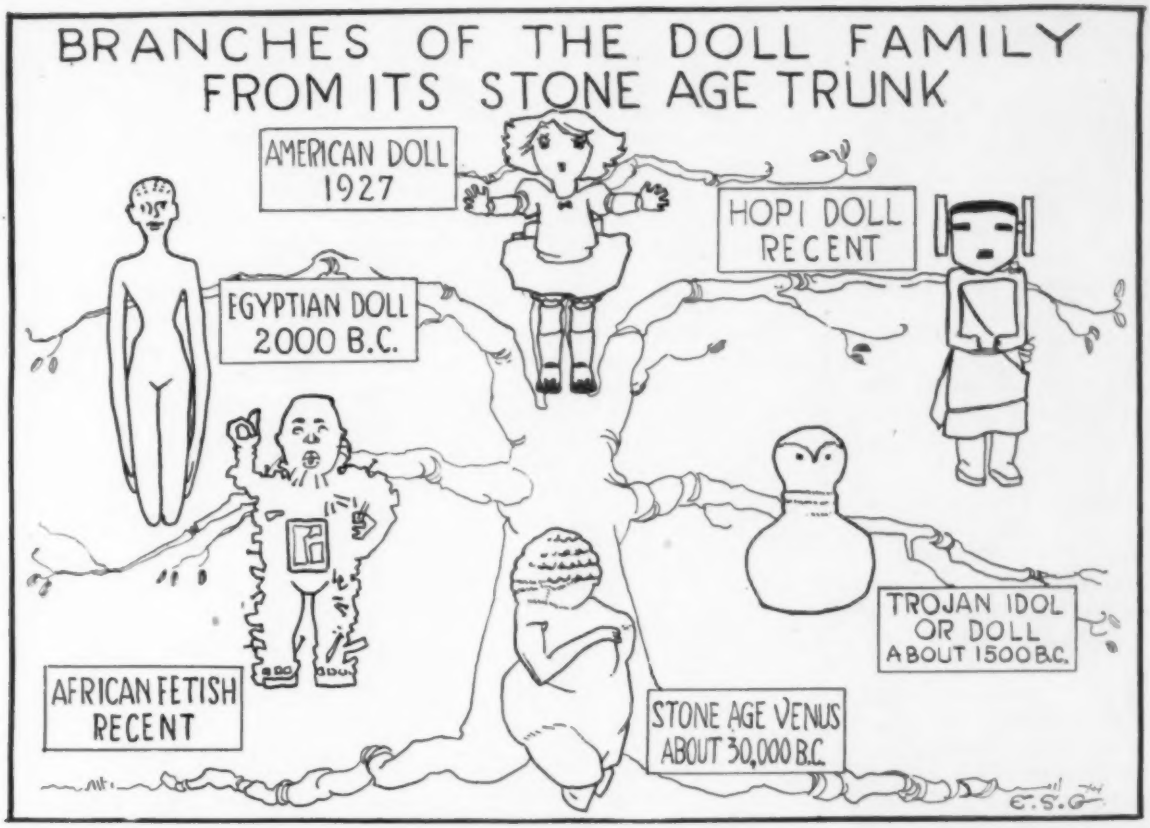
In spite of the Tennessee law, school teachers of that state and perhaps others may still be able to present evolution to their students without committing a crime, by simply reading the evolutionary ideas out of a book, like the daily reading of the Bible. This is the opinion of Henry E. Colton, Nashville lawyer, prominent in the hearings before the State Supreme Court on the famous Dayton case. This conclusion follows from a technical distinction between "teaching" and "reading" made by the court itself in its recent decision.

"Although it is a technical definition, it appears to be perfectly clear," Mr. Colton stated. "As pointed out in the opinion of Chief Justice Green and Cook, Chapter 102 of the Acts of 1915 requires that ten verses of the Bible be read each day at the opening of public schools, without comment, with the further proviso that the teacher does not read the same verses more than twice during any session and with the still further proviso that students may be excused from such reading upon the written request of their parents. After referring to this Chief Justice Green and Justice Cook say in substance that it could scarcely be contended that such 'scriptural reading' would amout to 'teaching.' By the same token it may be argued with reasonable certainty that teachers of biology and other kindred subjects in which the scientific theory of evolution constitutes a fundamental and necessary part, may at least read to their students about the scientific theory of evolution as to the origin of man without comment. With a bright student no comment is necessary. This distinction between 'reading' and 'teaching' is likely to be followed in many other states where anti-evolution litigation is in effect or pending."

Science News-Letter, February 12, 1927

The Jerusalem artichoke is an American plant.

Fetishes, charms, and idols are direct ancestors of modern dolls.



The cave man's children never played with dolls at all.

Dolls

(*Continued from page 94*)

here is to place a figure representing the sick person in a small boat. The boat is heavily loaded with supplies for a long voyage, and is set adrift. The spirits of evil will thus believe that their victim is escaping them. They will hasten to board the boat, and will be swept away on the current, and not return.

Basute women of Africa carry a doll-like image about until they become mothers. Sauk Indians of Iowa would at one time pay a horse for the use of an image which had power to foretell the sex of an unborn child. Tribes of the Bloomfield River region, in Australia, believe that a person can be doomed by making a wooden effigy of him and burying it in the ground.

Dr. Hough tells how the medicine man of the Zuni Indians would sprinkle an image with meal. He would smoke over it, and by other rites fill it with magic power. Then the image would be asked to assist in the hunt for deer. The Indians would ask where the deer could be found, and if the image was obliging it would send them straight on the track of the deer. When the hunters had killed the game they would reward the image by plunging it into the blood, so that it might feed on the venison, as the people would do. But if the hunt failed, the image was said to be exerting evil power, and it would be lashed and treated roughly.

And so the stories go on indefinitely, showing the importance of sorcery and the fear and awe surrounding objects used in working charms.

Dr. Hough's next step in doll lineage takes us among tribes of higher culture, with broader imagination. Some began to look on images, not as spirit-inhabited fetishes under the control of powerful medicine men, but as beings with higher attributes, more powerful than their creators, who must now supplicate and appease them.

"At some stage," said Dr. Hough, "the images began to be thought of as containing or representing the spirit of a man's ancestors. In the course of time, in such a process, the ancestors become deities. The idols in which the gods reside are naturally objects of great veneration. Larger and even gigantic gods are created and given correspondingly great powers and attributes. And for the purpose of personal worship, miniatures of these, charged with sanctity, are made and deposited in shrines.

"When the gods fall, as a religion decays or as a people is conquered by another, the cherished idols of former times are shorn of their power. The miniatures of the gods have now come down to the level of children, for whom they present the greatest fascination and by whom they are granted the least reverence."

On this branch of Dr. Hough's doll family tree might be hung old Roman dolls found in Egypt. One such figure has the head of a Roman god with rag clothes—an abandoned deity dressed as a doll for a child.

"In the slow progress of man, the growth of spiritual ideas has gradually drawn the world away from beliefs in the power of material things and thus idols have fallen into low estate," the ethnologist told the scientists when he reported his theory. "Among civilized peoples dolls awake no thoughts of their former import, but before this stage was reached there were many relapses. The Mosaic commandment against idolatry was a necessary prohibition against the making and worshipping of graven images. The Mohammedan injunction against the representation of living forms implied a similar purpose, and had a profound effect on the art of Islam.

"It may be asserted that the free use of dolls is evidence of the submergence of superstition and an advance to higher culture with the consequent broadening of religious ideas. It follows, therefore, that dolls as we know them are not of great antiquity, and the researches of archæology are illuminating on this point.

"The extensive use of dolls by the

(*Just turn the page*)

Dolls

(Continued from page 96)

Eskimo may seem to conflict with the assertion that dolls are toys of progress," Dr. Hough says, "yet more knowledge may show that the Eskimo child's doll is a spirit-inhabited charm, as Stefansson has shown that the Eskimo child itself is governed by a ghost ruler."

Dr. Hough's theory of the doll's evolution is supported by much evidence, and many minor gaps in the lineage of the doll which remain may be filled in as archæologists unearth new relics of the past. Ancient dolls in museums are still rare objects.

The oldest dolls which were presumably played with by children are those from Egyptian tombs. No dolls which can be recognized certainly as such have been recovered from Troy or from Crete, where civilization of a high order flourished. The Trojans had images, but from the surviving samples they were more like idols than dolls.

By the fifth century B. C. in Athens, in the time of Pericles, dolls were well established as playthings, and a Greek girl might have a jointed doll of considerable realism. One of these little terra cotta dolls, about five inches high, reposes in the museum of the University of Pennsylvania. It is a lady doll with hair piled high in a Greek chignon. The set smile which is now inbred as a fixed characteristic of the doll family is plainly seen, after 2,000 years.

Highly civilized dolls from the Roman Empire have also been found by archæologists. Some years ago, Baring Gould in his book of Strange Survivals wrote:

"A white marble sarcophagus occupies the centre of one of the rooms in the basement of the Capitoline Museum in Rome. The sarcophagus contains the bones and dust of a little girl, and by the side is the child's wooden doll, precisely like the dolls made and sold today. In the catacombs of St. Agnes, one end of a passage is given up to the objects found in the tombs of the early Christians, and among these are some very similar dolls taken out of the graves of the Christian children."

Even as a child's toy, the doll is still far from being as simple as it often looks. The child, corresponding more or less closely to primitive man in his own personal evolution, gives to the dolls psychic qualities, though in a harmless form with no trace of the primitive fears and superstitions. The dolls of Egypt and Rome, the modern doll of the Indian child, and the doll of the American girl all have strange attributes inherited from the old spirit image.

The dolls of an Egyptian child which were buried with her were not put in the grave so much from sentiment as because the image was thought to guard the child. Dolls of Pueblo tribes in this country commonly represent mythological characters and so have some religious significance, even though they are given to the children as prized possessions and occasionally the children are allowed to play with them as dolls.

And even where dolls are merely looked upon by adults as toys, no different from steam engines and picture blocks, their attraction for children is that they have life. Dolls can be dressed, fed, loved, and taught, and the dolls hear and respond. The doll is a sign of progress, as Dr. Hough shows, when adults outgrow it, and when they give it to the children, not as a dangerous fetish, but as a thing to be played with and loved.

If figures of the doll population of a country are an index of this progress, the United States is advancing. Toy manufacturers estimate that the dolls of this country number 200,000,000, or almost twice the human population. The average doll family of eight individuals makes most American families look small. The doll birth rate is about 20,000,000 a year, or about twelve times the human rate. And what is perhaps as significant as anything in the psychology of children's love for dolls, the average doll life has trebled in the past twenty years.

Science News-Letter, February 12, 1927

Until men found out how to build a true arch, about 2500 B. C., the longest bridge span was about 40 feet.

The Aztecs believed in special gods who brought diseases and in other gods who knew healing secrets.

The Columbia River region may have been the most thickly settled Indian center in this country in early times.

An insect's eyes are always in its head, but its hearing apparatus may be in its legs or other parts of the body.

BIOLOGY

Measure Heatless Light

The "cold light" of living things, such as fireflies and the bacteria and fungi that cause rotted wood to glow in the dark, has been made the subject of scientific measurement by Dr. W. W. Coblentz and Dr. C. W. Hughes of the U. S. Bureau of Standards. These humble organisms are so much more efficient in getting light out of a given amount of energy than the best incandescent lamp which man has yet devised that they are at once the admiration and the despair of scientists, and they may some day furnish a hint that will revolutionize the whole art of illuminating engineering. For this reason physicists and biologists are always at them, trying to pry open their secret.

In their present study, the two government scientists have split up the light of these organisms by means of a spectroscopic prism to learn accurately of what colors it is composed, and they have also measured the amount of energy in each of the color bands with a device that makes use of a sensitive photographic plate. The photographic exposures necessary varied from an hour in the case of the firefly to three days with pieces of "fox-fire" wood.

They found that the various organisms varied widely in the range of colors that go to make up their light, as well as in the particular color most intensely present in the glow. Thus, the light of "fox-fire" wood, which comes not from the wood but from a fungus in it, included all colors from blue-violet down to red-orange, with the highest intensity in the green, and a smaller high point in the yellow. In a certain glowing sea-creature the range shifted toward the violet end of the spectrum, going beyond the light of the "fox-fire" and almost to the limit of visibility, but stopping short at orange and excluding red at the lower end. The point of highest intensity for this animal's light was a slightly greenish blue. The firefly with which they experimented had an uneven distribution of color in its spectrum, but was strongest in the yellow. They also tested certain zinc compounds that glow in the dark, for purposes of comparison.

The light from these glowing animals and lowly plants does not come from a slow combustion of their substance, as was once supposed, but from a sort of digestive process which involves a special material secreted by the organism and a special enzyme that works upon it and causes it to shine, according to Prof. E. N. Harvey of Princeton, who has studied this phenomenon of "bioluminescence" from the biological point of view. When these two things come into contact, other conditions being favorable, the light appears. It is also possible to take the "luciferin" of one animal and cause it to glow by adding the enzyme, or "luciferase," of a different species.

Science News-Letter, February 12, 1927

Mountains Influenced Greece

A spiny backbone of mountains across the center of Greece played a big part in shaping events in the famous civilization of the old Greeks according to Dr. J. L. Myres, noted British archælogist, who is visiting this country.

In prehistoric times, much of this mountain zone was shattered by earthquakes and submerged for about half its total height, leaving a gulf filled with islands and promontories, which represent the peaks and ridges of the sunken highland scenery, Dr. Myres explains.

When men learned to use the treasures of the mountains they found there marble, copper, iron, and gold. But the almost complete absence of coal was responsible for a permanent shortage of power in the Greek world. This was reflected in the constant shortage of labor and the prevalence of slavery.

The peculiar climate of Greece, with its mild wet winter and hot, dry summer, made this unpromising region habitable and made possible its great, highly specialized civilization. Where there was enough moisture, grain crops were possible, but these are always precarious in the Mediterranean, and the only secure crops were from selected deep-root trees, such as the vine and olives. Greek agriculture consequently became more and more an intensive production of oil and wine. The industries promoted by local conditions were textile production, based on the wool from the pastures, and hardware of various kinds derived from the mineral resources of the old crystalline rocks.

Dr. Myres concludes that out of geographic conditions the great civilizations arise. And in times of adversity man reverts to the early close dependence upon climate, soil, and sea.

Science News-Letter, February 12, 1927

The average child between four and five uses 1,700 words.

PSYCHOLOGY

Song for Infantry

The U. S. Infantry's desire for a song of its own illustrates the psychological effect of the symbol in the opinion of Prof. Harry L. Hollingworth of Columbia University.

Other branches of the service have songs which may be regarded as their special property, but the Infantry has none. This lack so impressed officials of the Army that they have inaugurated a contest in the hope of obtaining music and possibly words for a song, to express the spirit of the "plodding, hiking, dogged, storming, fighting Infantry."

A symbol is necessary, Prof. Hollingworth says, in all organizations that draw their vitality from emotional sympathy on the part of their members. Every religion has some symbol, be it crucifix, crescent or idol, which in the minds of the followers evokes the emotions connected with the religion. Each country has a flag, the sight of which tacitly reminds citizens of struggles, victories, defeats. Likewise a song standing for a certain organization may bring to life dormant emotions on which the organization bases its existence.

Esprit de corps, according to Prof. Hollingworth, is founded on emotion. And the power of the Infantry as a body of men working in harmony lies in the development of esprit de corps. A sure means of arousing harmony is to identify an organization with a catchy song.

Science News-Letter, February 12, 1927

ZOOLOGY

Seal Herd Increasing

Seal skin coats are not likely to become an extinct fashion if the Alaskan fur seal population keeps on growing.

The Alaskan seal herd, according to counts made by the U. S. government, has increased from a quarter of a million in 1912 to three-quarters of a million in 1925, according to Prof. G. H. Parker of the department of zoology at Harvard University.

At the beginning of this century the numbers of the Alaskan herd were seriously reduced, but it began to recover when deep sea sealing was made illegal. Even with the resumption of commercial killing in 1918 no deterrent effects were observed on the growth of the herd, declared Professor Parker, though internal social adjustment of considerable interest has taken place as the result of selective killing off of mature males.

Science News-Letter, February 12, 1927

ARCHÆOLOGY

No Roman Horse Collars

Did Rome fall because no public-spirited citizen knew enough to invent a harness that would adequately utilize horse power, This weak joint in the armor of the fallen empires of antiquity was pointed out by Commandant Lefebvre des Noettes at a recent meeting of the French Institute of Anthropology.

Commandant des Noettes has made a complete survey of the history of the use of animal motive power from the early dawn of civilization down to the present time. The harness of the ancients, he explained, had for its principal organ of traction a collar consisting of a leather band that went around the neck like a dog collar without touching the shoulders and which was attached to a wooden yoke just above the withers. This collar was so placed that it most effectively cut off the animal's wind by pressing on his wind pipe and the large artery of the throat.

As soon as a team felt the weight of a chariot and its passengers exerting pressure on the collar they were forced to rear up their heads and dash off to save themselves from strangling. Hence the rampant attitude of all the horses depicted in ancient papyri and sculptures, declared Commandant des Noettes.

As a result of this drawback the great civilizations of the past were never able to get more than a fraction of the potential motive power from their horses. Ox teams operating with a wooden yoke attached to the horns, not greatly different from that in use today, did not suffer from the oppressive collar and in consequence did most of what heavy hauling was done. Both oxen and horses were unshod and in consequence were not much good in rough ground.

Data obtained from translations of the Greek Historian Xenophon and from the Theodosian code about a thousand years later, said Commandant des Noettes, indicate that no team of oxen in ancient times was ever considered capable of transporting a load of over half a ton. Various ineffectual attempts were made to modify to better advantage the accepted type of harness, but not until after the era of Charlemagne, about the time of the beginning of the Capet dynasty in France, did some inventive genius devise the horse collar that was practical.

For six hundred years the water mill for grinding corn had failed to bring great benefit to the Romans simply because it took numberless animals to draw enough grain to supply its needs. Where grain could not be transported in ships the arduous labor of hand grinding continued to be the order of the day. The lack of adequite transportation of raw products and the consequent dependence on slave labor, according to Commandant des Noettes, constituted the great weakness of the civilizations of the past. The invention of the modern harness gave to the world, he declared, a motive force, more powerful and economical than slavery.

Science News-Letter, February 12, 1927

PHYSICS

Danger in Unwashed Dishes

Never let the dishes in which gelatin desserts have been served stand over night in the kitchen sink! This is the warning issued to housewives by Dr. Victor Cofman, physical chemist, at Pennsylvania State College. For gelatin is a colloid, one of those hybrid substances that, from the point of view of the physicist, are neither a solid nor a liquid. When gelatin drys up the force it exerts is strong enough to pull chips of glass out of the family sherbet glasses.

The ancient Egyptians exercised this same principle of colloid dynamics, Dr. Cofman declared, when they drove a wooden wedge into a crack and then poured water on it to swell the wedge and so split the rock. When the dried colloids in the wood absorb moisture, they expand and exert terrific pressure.

Science News-Letter, February 12, 1927

BOTANY

Counterfeit Plants

Counterfeiting of rare botanical specimens from Mexico has been discovered by Dr. Paul C. Standley of the National Herbarium, U. S. National Museum, in the course of arranging the government's immense collections of dried and pressed plants. About ten years ago, Brother G. Arsene of the Christian Brothers religious order, an enthusiastic botanist, sent to the National Museum here and to France, extensive collections of Mexican plants. But the demand for Mexican plant specimens was greater than the supply and unscrupulous botanical dealers in Europe counterfeited Brother Arsene's plants by using false labels and plants more easily obtained from other localities.

Science News-Letter, February 12, 1927

The majority of snow storms deposit only from two to five inches of snow.

PSYCHOLOGY

Likes Linked with Careers

The list of things a bookkeeper likes and dislikes differs from an actor's list or a soldier's. A new method of measuring these characteristic interests in individuals for use in guiding them into congenial careers is described by Edward K. Strong, Jr., psychologist at Stanford University.

Dr. Strong's method measures the similarity between the interests of the person tested and the interests of a given occupational group. The test includes 263 items and the individual must say that he likes, dislikes, or is indifferent to each item. For instance, the majority of certified public accountants like bookkeeping. If an individual likes bookkeeping he is credited with an interest that is characteristic of certified public accountants. The complete test, Dr. Strong explained, discovers whether or not an individual's interests coincide with those interests which distinguish a certain occupational group from other groups.

It has been shown that college students planning to be engineers have about the same line of interests as experienced engineers, Dr. Strong stated. This indicates that the interests characteristic of an occupation are present in men prior to technical training and practical experience.

"Presumably these interests lead to their vocational choice, and are not the result of the vocation itself," he said.

Science News-Letter, February 12, 1927

MEDICINE

Fungi As Causes of Disease

Fungi may play an important role in certain types of infection in man, according to Dr. C. L. Shear of the U. S. Department of Agriculture. He states that the constantly increasing number of microfungi found associated with lesions and other diseased conditions in man emphasizes the need of more detailed research on their life histories and relationships with other organisms.

The parasitic fungi that make up many of the types thus far found associated with diseased conditions in man are very difficult to grow in the laboratory. Close cooperation between medical men and the expert mycologist, or specialist in fungi, is necessary for the understanding and clearing up this as well as many other problems in this field, Dr. Shear declares.

Science News-Letter, February 12, 1927

PHOTOGRAPHS OF SCIENTISTS

Science Service has a collection of nearly 2,000 photographs of scientists throughout the world. The second installment of this list is published below. Although this list has been checked with care, corrections are requested, since a complete catalog will be issued later. Photographs of scientists not listed are desired.

For the convenience of teachers and scientific enthusiasts, these photographs are offered for sale. Any ten photographs (each postcard size 3⅛ x5⅜ inches) will be sent postpaid for only $2.00. Enlargements, 8 x 10 inches, are $1.00 each postpaid. Postcard pictures are finished only in black and white, but enlargements are offered either in black and white or sepia on buff stock. Please specify which.

Starred (*) photographs can be furnished as $1.00 enlargements only. Photographs at these prices are sold with the understanding that they are not to be used for publication.

B (Continued)

934 Bone, William A., Chemistry, Imperial College, London
760 Bonar, Lee, Botany, Univ. of California
10052* Bondy, Hugo, Sociology, Prague
10011* Borel, E., Mathematics, Paris
1381 Borodin, D. N., Agriculture, Russia
1028 Borodin, N., Ichthyology, Russia
1024 Borchma, W., Zoology, Univ. of Lydan, Holland
568 Borsook, Henry, Biochemistry, Univ. of Toronto
1383 Borza, D. Alexandre, Ecology and Taxonomy, University of Cluj, Roumania
1453 Bozart, L. W., Research Chemist, Proctor & Gamble Company
562 Bott, E. A., Physiology, University of Toronto
10010* Boucherot, Prof. Superior Electrical Sch., Paris
10048* Bouin, Physiology, Strassburg
10012* Bouvier, Zoology, Prof. Museum of Nat. Hist., Paris
837 Boving, Adam G., Entomology, U. S. Bureau Ent.
6054 Bowen, I. S., Physics, Norman Bridge Lab.
130 Bowen, Robert H., Zoology, Columbia University
751 Boyers, L. M., Pathology, Univ. of California
22 Bradley, H. C., Phys.-Chemistry, Univ. Wisconsin
924 Bragg, Sir W. H., Physics, Royal Inst. London
925 Bragg, W. L., Physics, Univ. Manchester, England
917 Bramwell, J. Creghton, Internal Medicine, University of Manchester
762 Brandegee, Townshend S., Botany, Univ. of Calif.
667 Bray, Archie W. Leslie, Physiology, St. Louis, Mo.
203 Bray, Wm. C., Chemistry, University of Calif.
10008* Breasted, James H., Egyptology, Univ. of Chicago
1125 Breitenbecher, Joseph, Zoology, Univ. of Oklahoma
10015* Bretan, Director, National Office Researches on Science, Paris
535 Brett, G. S., Philosophy, Univ. of Toronto.
1404 Bridel, Marc, Pharmacy, Paris
122 Bridges, Calvin B., Genetics, Columbia University
6055 Brigham, Carl C., Psychology Dept. Princeton Univ.
1135 Bright, Elizabeth M., Harvard Medicine
1490 Brinton, Clement S., Phila. Food & Drug Station
996 Brock, R. W., Geology, Univ. British Columbia
788 Brockett, Paul, Secretary, Natl. Acad. Sciences
875 Bronfenbrenner, Jacques Jacob, Bacteriology, Rockefeller Inst.
235 Brooks, Allan, Artist, University of California
1300 Brooks, Mrs. M. M., Botany, Hygenic Laboratory
38 Brooks, Sumner C., Physiology, U. S. Public Health Service
850 Brown, Alice, Anatomy, Cornell Medical School
1210 Brown, Barnum, Paleontology, Am. Museum of Natural History
662 Brown Edgar D., Pharmacology, Univ. Minn.
946 Brown, E. W., Astronomy, Yale University
1094 Brown, S. Leroy, Physics, Univ. of Texas
1034 Brown, Wade H., Bacteriology, Rockefeller Inst.
1305 Brown, Wm. H., Botany, Bureau of Science, Manila
2051 Browne, C. A., Chemistry, U. S. Dept. Agric.
1224 Browne, Wm. W., Bacteriology, College of City of New York
927 Bruce, Sir David, Medicine, English Army
1169 Brunquise, E. H., Physiology, Univ. of Colorado Medical School
6056 Brush, Chas. P., Physics, Cleveland
1106 Bryan, A. B., Physics, Rice Inst.
200 Bryant, Harold C., Ornithology, Calif. Mus. Zool.
1203 Bryant, R. C., Forestry, Yale School of Forestry
1010 Bucholz, J. T., Botany, Univ. of Arkansas
484 Buckley, Albert C., Neuro-Psychiatry, Friends Hospital, Philadelphia
888 Budington, R. A., Zoology, Oberlin College
1112 Buell, Mary V., Chemistry, Johns Hopkins Med.
10047* Buhld, Charlotte, Sex Psychology, Vienna
681 Bulatao, E., Physiology, Univ. of the Philippines
454 Bumpus, Herman C., Biology, Brown University
260 Burd, J. S., Plant Nutrition, Univ. California
1161 Burgess, G. K., Metallurgy, U. S. Bureau Standards
318 Burlingame, L. L., Biology, Stanford University
1215 Burlingham, L. H., Supt. Barnes Hospital, St. Louis
195 Burnett, T. C., Physiology, Univ. of California
6057 Burns, Keiven, Astronomy, Allegheny Observatory
743 Burr, G. O., Anatomy, University California
660 Burrows, Montrose T., Exp. Surgery, Washington University Medical School
769 Burton, Alfred E., Engineering, Mass. Inst. Tech.
537 Burton, E. F. Physics, University of Toronto
1290 Butler, E. J., Mycology, Kew Garden, London
258 Buwalda, John P., Geology, Univ. California
929 Buxton, L. H., Anthropology, Oxford Univ., England

C

379 Caldwell, George T., Biology, Univ. of Arizona
23 Calkins, Gary N., Zoology, Valpariso, Ind.
768 Callander, C. Latimer, Surgery, Univ. of Calif.
1245 Calvert, Philip P., Zoology, University of Pa.
295 Campbell, D. H., Botany, Stanford University
267 Campbell, W. W., Astronomy, Univ. of California
1335 Canis, Otto P. M., Botany, N. J. College
1154 Cannan, R. Keith, Biochemistry, Univ. College, Lon.
6058 Cannon, Annie Jump, Astronomy, Harvard Obs.
71 Carothers, E. E., Zoology, Univ. of Penna.
908 Carr, H. Wildon, Philosophy, Kings Coll, England
1032 Carrel, Alexis, Exp. Surgery, Rockefeller Inst.
1474 Carroll, Burt H., Chemist, U. S. Bureau of Stand.
75 Carroll, Mitchell, Entomology-Cytology, Franklin & Marshall College
502 Carter. T. D., Mammalogy, Amer. Mus. Nat. Hist.
1128 Carver, G. L., Genetics, Mercer Univ., Macon, Ga.
948 Case, E. C., Geology, University of Michigan
1424 Case, Muriel A., Biology, Mt. Desert Isle
107 Casteel, D. B., Zoology, Univ. Station, Austin
1200 Castle, Hempstead, Botany, Yale University
372 Cattell, Jack, Entomology, Amer. Men of Science
143 Cattell, J. McKeen, Psychologist, Garrison, N. Y.
137 Cattell, Ware, Physiology, Cornell University
1181 Cecil, Russell L., Cornell Univ. Medical College
152 Chambers, Robert, Anatomy, Cornell Med. School
1144 Chambers, William H., Physiology, Cornell University Medical School
385 Chandler, Asa C., Zoology, Rice Institution
375 Chandler, Elbert Edwin, Chemistry, Occidental Col.
757 Chandler, W. H., Pomology, Univ. of California
254 Chaney, Ralph W., Geology, Iowa City, Iowa
496 Chapin, James P., Ornithology, Am. Mus. Nat. Hist.
1455 Chapin, W. H., Chemistry, Oberlin College
748 Chapman, Chas. H., Mathematics, Portland, Oregon
63 Charlton, H. H., Anatomy, University of Missouri
1202 Chapman, Herman H., Forestry, Yale University
1274 Chen. T. Y., Zoology, Yenching University, Peking, China
118 Chidester, F. E., Zoology, Univ. of W. Va.
397 Child, C. M., Zoology, Univ. of Chicago
1498 Chin, Yan Tsz, Chemistry, Lingnan University, Canton, China
1345 Chittenden, Fred J., Horticulture, London
1341 Chodat, Robert, Botany, University de Geneve, Swuisse.
626 Chouke, Kehar Singh, Anatomy, Washington University Medical School
881 Chown, Bruce, Medical Doctor, Univ. of Manitoba
1361 Chrysler, M. A., Botany, Univ. of Maine
520 Chubb, S. H., Osteology, Am. Mus. Nat. Hist.
1275 Ciocaltau, Vintila, Biochemistry, Bucharest Medical School
3 Clapp, C. M., Zoology, Mount Holyoke Coll.
256 Clark, B. L., Paleontology, Univ. of California
45 Clark, Eliot M., Anatomy, University of Georgia
193 Clark, Guy W., Biochemistry, Univ. of California
1029 Clark, James L., Sculptor, Am. Mus. Nat. Hist.
1398 Clark, Wm. Mansfield, Hygienic Lab., U. S. P.H.S.
247 Clausen. R. E., Genetics, Univ. of California
6059 Clayton, H. H., Meteorology, Canton, Mass.

(To be continued)

BIOLOGY

NATURE RAMBLINGS

By FRANK THONE

Winter Flowers

In the central part of the United States an unusually mild winter may give notice of its approaching end in mid-February by a display of early pussy-willows and alder catkins, the earliest, save perhaps the malodorous skunk cabbage, of our spring flowers. Even along the Canadian border these signs may be seen a couple of weeks later.

But one need not wait for winter to end outdoors, nor content one's self with pussies and catkins, attractive as these may be. Whoever wishes them may have, now, before the first of March, any of the tree-flowers that ordinarily blossom in April or May. It is so easy to get them that it is a wonder the custom is not more widely practiced.

One does not need to be a florist to carry on this simple home forcing of woody branches. All you need to do is cut them—lilac, plum, cherry, peach, what you will—and place the branches in a jar of water in a warm corner. Change the water once every two or three days, to keep it from becoming foul, and watch the buds as they swell up and shed their scales and begin to show signs of color. The process may be hastened by laying the branches in a pan of warm water for a quarter of an hour when they are first brought into the house, but even this is not necessary.

Forsythia, or golden bell, will come into flower in about ten days, some kinds of cherries about as soon, wild plum and Japanese quince require about two weeks. The shrub most amenable to this treatment seems to be the honeysuckle, which has been known to burst into bloom within three days after it has been brought into the house.

Science News-Letter, February 12, 1927

An expedition is seeking skeletons of prehistoric dinosaurs in Tanganyika, Africa.

Teeth of man and prehistoric apes have been linked in an evolutionary series by two American scientists.

AVIATION

Weather Bureau Aids Airmen

How the Weather Bureau is carrying out the instructions of an act of Congress passed last spring, providing that it should furnish weather information such as is necessary for the safe operation of commercial flying, is described by Willis R. Gregg, meteorologist at the Bureau. "Since July 1, 1926," says Mr. Gregg, "the Weather Bureau has established pilot balloon work at 21 stations along airways, these stations being in addition to some 15 that were previously in operation in different parts of the country. The observations are made twice each day and provide information concerning upper wind direction and velocity at all flying levels.

"This information and a general resume of surface conditions are given to the pilots through special reports that are exchanged between the principal points along the airways. The data that have been found to be of most value are those concerning ceiling, or height of clouds, and visibility, but information is always desired also concerning upper winds and the occurrence of fog, rain, thunderstorm, heavy snow or any other unfavorable or threatening condition.

"In addition to the current report fliers are furnished with special forecasts, these are of two classes—the short-range forecasts covering the scheduled duration of individual flights and the more general forecasts for 12 to 24 or more hours. So far as aviation is concerned, the former are of course the more useful."

Science News-Letter, February 12, 1927

GEOLOGY

Australia Joined to Hawaii?

Were Australia, New Zealand and Hawaii once parts of huge land masses in the Southern Pacific? Prof. Douglas Houghton Campbell of Leland Stanford University told delegates of the Pan Pacific Science Congress that the very real relationship of the vegetation of these three regions points to such a possibility.

The kinship of the Hawaiian flora to that of New Zealand is more marked than it is to that of Australia, but it furnishes a basis strong enough to justify the assumption that such connecting land masses formerly existed between Hawaii and the other two countries, the California scientist declared.

Science News-Letter, February 12, 1927

EDUCATION

Studies Student Viewpoint

The value of viewing curriculum from the pupil's standpoint is stressed by Dr. Jesse E. Adams of the University of Kentucky.

"It has begun to dawn upon us that the attitudes and ideals built up when pupils must take subjects they do not like may be far more detrimental than all the subject matter they get," he says. "It would seem that those who are responsible for making our curriculums should be fully cognizant of how deadening failures are and to what extent forced interests burn the candle at both ends. I believe Otis Caldwell was quite right when he said: 'Pupils develop fastest when engaged most of their time upon things in which they succeed and not fail."

Dr. Adams' interest in the viewpoint of the students led him to make a survey of high school pupils in Kentucky. It was found that mathematics and Latin were responsible for far the greatest percentage of the failures. The difficulty and lack of practical application of these subjects made them very unpopular. Algebra, geometry and Latin were wanted out of the curriculum. Of the subjects which the pupils wanted to take and could not get, the girls agreed upon domestic science, French, Spanish, typewriting and bookkeeping, and the boys upon manual training, chemistry, typewriting and bookkeeping.

Science News-Letter, February 12, 1927

CHEMISTRY

Synthetic Hormone

Thyroxin, the hormone of the thyroid gland, has been made synthetically for the first time in the laboratories of University College, London.

Dr. C. R. Harington and Prof. George Barger are the workers who have achieved this result from researches supported by funds supplied by the Rockefeller Foundation to the University College Hospital Medical School in 1920. The hormone, which is used in treating patients with a defective thyroid gland, was first isolated by Dr. E. C. Kendall of the Mayo Clinic in 1917. Its production synthetically from coal tar products and iodine will assure an absolutely even standard, medical authorities say, and should have the effect of making the price much lower.

Science News-Letter, February 12, 1927

How to Use Key-Word Feature of News-Letter

In order to aid in catching the items that concern you and to facilitate clipping and filing, a key word in small capitals has been printed on the right of the line above each article. The key words used fit into any system of classification, whether it be a straight alphabetical file, a system of your own devising, the Library of Congress classification or the Dewey system.

Note that you can clip out any article without fear of damaging another article in which you might be interested, since editorial matter printed on the righthand pages is backed by advertising, standing matter or a continuation of the article on the other side.

Library of Congress Classification

The classification of the Library of Congress has come into common use in the libraries of the country owing to the publication of the Government of the card index of all new books. We print below a list of the subject titles which are most used in the SCIENCE NEWS-LETTER. The full scheme of classification is contained in "Outline Scheme of Classes," issued by the Library of Congress.

B Philosophy.
BF Psychology.
G Geography, voyages, travel.
GA Mathematical and astronomical geography.
GB Physical geography.
GC Oceanology and oceanography.
GF Anthropogeography.
GN Anthropology. Somatology. Ethnology. Ethnography. Prehistoric archæology.
GR Folklore.
GT Manners and customs.
GV Sports and amusements. Games.
HC Economic history and conditions. National production.
HE Transportation and communication.
HF Commerce.
HM Sociology. General.
L Education.
M Music.
N Fine Arts.
P Philology and linguistics.
Q Science. General.
QA Mathematics.
QB Astronomy.
QC Physics.
QD Chemistry.
QE Geology.
QH Natural history.
QK Botany.
QL Zoology.
QM Human anatomy.
QP Physiology.
QR Bacteriology.
R Medicine. General.
S Agriculture. General.
SB Field crops. Horticulture. Landscape gardening. Pests and plant diseases.
SD Forestry.
SF Animal culture. Veterinary medicine.
SH Fish culture and fisheries.
SK Hunting. Game protection.
T Technology. General.
TA Engineering—General.
TC Hydraulic engineering.
TD Sanitary and municipal engineering.
TE Roads and pavements.
TF Railroads.
TG Bridges and roofs.
TH Building construction.
TJ Mechanical engineering.
TK Electrical engineering and industries.
TL Motor vehicles. Cycles. Aeronautics.
TN Mineral industries. Mining and Metallurgy.
TP Chemical technology.
TR Photography.
TS Manufactures.
TT Trade.
TX Domestic science.
U Military science. General.
V Naval science. General.

Dewey Classification

The main divisions of the Dewey Decimal Classification, used in many libraries and by many individuals, is given below for the convenience of those who wish to use this system:

000 GENERAL WORKS—
010 Bibliography
020 Library economy
030 General cyclopedias
040 General collected essays
050 General periodicals
060 General societies
070 Newspapers
080 Special libraries. Polygraphy
090 Book rarities
100 PHILOSOPHY—
110 Metaphysics
120 Special metaphysical topics
130 Mind and body
140 Philosophical systems
150 Mental faculties. Psychology
160 Logic
170 Ethics
180 Ancient philosophers
190 Modern philosophers
200 RELIGION—
210 Natural theology
220 Bible
230 Doctrinal. Dogmatics. Theology
240 Devotional. Practical
250 Homiletic. Pastoral. Parochial
260 Church. Institutions. Work
270 Religious history
280 Christian churches and sects
290 Ethnic. Non-Christian
300 SOCIOLOGY—
310 Statistics
320 Political science
330 Political economy
340 Law
350 Administration
360 Associations. Institutions
370 Education
380 Commerce. Communication
390 Customs. Costumes. Folklore
400 PHILOLOGY—
410 Comparative
420 English
430 German
440 French
450 Italian
460 Spanish
470 Latin
480 Greek
490 Minor languages
500 NATURAL SCIENCE—
510 Mathematics
520 Astronomy
530 Physics
540 Chemistry
550 Geology
560 Paleontology
570 Biology
580 Botany
590 Zoology
600 USEFUL ARTS—
610 Medicine
620 Engineering
630 Agriculture
640 Domestic economy
650 Communication. Commerce
660 Chemical technology
670 Manufactures
680 Mechanic trades
690 Building
700 FINE ARTS—
710 Landscape gardening
720 Architecture
730 Sculpture
740 Drawing. Decoration. Design
750 Painting
760 Engraving
770 Photography
780 Music
790 Amusements
800 LITERATURE—
810 American
820 English
830 German
840 French
850 Italian
860 Spanish
870 Latin
880 Greek
890 Minor languages
900 HISTORY—
910 Geography and travels
920 Biography
930 Ancient history
Modern
940 Europe
950 Asia
960 Africa
970 North America
980 South America
990 Oceanica and polar regions

First Glances at New Books

APPLIED X-RAYS—George L. Clark—*McGraw-Hill.* An account of recent applications of the youthful science of X-rays to problems of industry.

Science News-Letter, February 12, 1927

CHAUCER AND THE MEDIAEVAL SCIENCES—Walter Clyde Curry—*Oxford* ($2.50). An illuminating study on the scientific beliefs of the time of Chaucer.

Science News-Letter, February 12, 1927

APPLIED CHEMISTRY EXPERIMENT SHEETS — Martin Mendel — *Globe.* ($0.93). A series of experiments and questions planned for high school chemistry courses with blank data sheets on which to record the observations of each experiment.

Science News-Letter, February 12, 1927

CLINICS, HOSPITALS AND HEALTH CENTERS—Michael M. Davis—*Harper* ($5). Reviews the history of outpatient work and clinics in this country, and outlines their underlying principles of policy and organization.

Science News-Letter, February 12, 1927

A TREATISE ON PNEUMONIC PLAGUE—Wu Lien-teh—*Health Section of the League of Nations.* An invaluable collection of the available information on pneumonic plague gathered from widely scattered sources and brought up-to-date from the pre-Black Death era.

Science News-Letter, February 12, 1927

PROPERTIES OF INORGANIC SUBSTANCES—Wilhelm Segerblom—*Chemical Catalog Co.* An invaluable handbook giving the chemical formulae, common trade names and properties of some 1,500 inorganic chemical compounds revised and brought up-to-date.

Science News-Letter, February 12, 1927

THE UNIVERSITY AFIELD—Alfred L. Hall-Quest—*Macmillan* ($3).

A careful and thorough-going examination of the university extension movement, and an estimate of its value and possibilities as a means of adult education.

Science News-Letter, February 12, 1927

FARM POPULATION OF THE UNITED STATES, 1920—Leon E. Truesdell—*Government Printing Office* ($1.75). What is happening to people on the farms is shown in many tables of figures in this census monograph. A useful sourcebook of facts and figures for those interested in social and economic problems.

Science News-Letter, February 12, 1927

PHYSICS

Radioactivity and Mythology

Quotation from THE INTERPRETATION OF RADIUM, AND THE STRUCTURE OF THE ATOM. By Frederick Soddy. New York: G. P. Putnam's Sons. 1922. Prof. Soddy is one of the British pioneers in discovering the nature of matter.

It is curious how strangely some of the old myths and legends about matter and man appear in the light of the recent knowledge. Consider, for example, the ancient mystic symbol of matter, known as Ouroboros — "the tail devourer"— which was a serpent, coiled into a circle with the head devouring the tail, and bearing the central motto, "The whole is one." This symbolizes evolution; moreover, it is evolution of matter—the very latest aspect of evolution—the existence of which was strenuously denied by Clerk Maxwell and others of only last century. The idea which arises in one's mind as the most attractive and consistent explanation of the universe in the light of present knowledge is, perhaps, that matter is breaking down and its energy being evolved and degraded in one part of a cycle of evolution, and in another part, still unknown to us, the matter is being again built up with the utilization of the waste energy. If one wished to symbolize such an idea, in what better way could it be done than by the ancient tail-devouring serpent?

Some of the beliefs and legends which have come down to us from antiquity are so universal and deep-rooted that we are accustomed to consider them almost as old as the race itself. One is tempted to inquire how far the unsuspected aptness of some of these beliefs and sayings to the point of view so recently disclosed is the result of mere chance or coincidence, and how far it may be evidence of a wholly unknown and unsuspected ancient civilization of which all other relic has disappeared. It is curious to reflect, for example, upon the remarkable legend of the philosopher's stone, one of the oldest and most universal beliefs, the origin of which, however far back we penetrate into the records of the past, we do not probably trace to its real source. The philosopher's stone was accredited the power not only of transmuting the metals, but of acting *as the elixir of life.* Now, whatever the origin of this apparently meaningless jumble of ideas may have been, it is really a perfect and but very slightly allegorical expression of the actual present views we hold today. It does not require much effort of the imag-

(*Just turn the page*)

BIOLOGY

The Biologist's Pastoral

(It is often said that a scientist falls in love with his work, and why should not he therefore write a poem to it and the place where he has wooed more knowledge?)

O come with me and be my love
And we will all the pleasures prove
Of kymograph and microtome,
Immersion oil and chromosome.

We'll feed thyroids to pollywogs
And watch them changing into frogs.
They say that thymus makes 'em fat
But we must prove the truth of that.

We'll spend a portion of our lives
In grinding up our section knives,
And when at last they'll clip a hair
Some *Ascaris* we will prepare.

Through woods by rippling brooks
we'll wander,
And catch the squirming salamander.
Ohio's muddy streams shall lure us
To where perhaps we'll find *Necturus.*

We'll scramble up the mountain side,
To caverns where *Spelerpes* hide;
And snakes look out in wonderment,
To guess our purpose and intent.

Then with the mechanistic faction
We'll live by chemical reaction,
For naught can charm a mechanist
Save make researches and exist.

A balanced ration must suffice,
No matter if it isn't nice.
Till with Pure Science as our goal,
We reach the haven of Woods Hole.

If this of use to science prove,
Then come with me and be my love.

Philip Pope.

Science News-Letter, February 12, 1927

HORTICULTURE

Male Asparagus Best

Male asparagus plants have it all over the females of the species.

Records of experimental planting of asparagus made in California show that male plants have a much greater yield than the female ones. Some 372 pounds per acre go to the credit of the male plants the first year as against 278 pounds on the part of the female asparagus. The second year the masculine preponderance was even greater, being 2,556 versus 1,612 pounds per acre.

Methods for determining the sex of the young asparagus seedlings while still in the nursery are being studied in the California laboratories so that in the future only male plants will be set out.

Science News-Letter, February 12, 1927

Radioactivity and Mythology

(*Continued from page* 105)

ination to see in energy the life of the physical universe, and the key to the primary fountains of the universe today is known to be transmutation. Is, then, this old association of the power of transmutation with the elixir of life merely a coincidence? I prefer to believe it may be an echo from one of many previous epochs in the unrecorded history of the world, of an age of men which have trod before the road we are treading today, in a past possibly so remote that even the very atoms of its civilization literally have had time to disintegrate.

Let us give the imagination a moment's further free scope in this direction, however, before closing. What if this point of view that has now suggested itself is true, and we may trust ourselves to the slender foundation afforded by the traditions and superstitions which have been handed down to us from a prehistoric time? Can we not read into them some justification for the belief that some former forgotten race of men attained not only to the knowledge we have so recently won, but also to the power that is not yet ours? Science has reconstructed the story of the past as one of a continuous Ascent of Man to the present-day level of his powers. In face of the circumstantial evidence existing of this steady upward progress of the race, the traditional view of the Fall of Man from a higher former state has come to be more and more difficult to understand. From our new standpoint the two points of view are by no means so irreconcilable as they appeared. A race which could transmute matter would have little need to earn its bread by the sweat of its brow. If we can judge from what our engineers accomplish with their comparatively restricted supplies of energy, such a race could transform a desert continent, thaw the frozen poles, and make the whole world one smiling Garden of Eden. Possibly they could explore the outer realms of space, emigrating to more favorable worlds as the superfluous today emigrate to more favorable continents. The legend of the Fall of Man, possibly, may be all that has survived of such a time before, for some unknown reason, the whole world was plunged back again upnder the undisputed sway of Nature, to begin once more its upward toilsome journey through the ages.

Anniversaries of Science

February 16, 1923.—Sealed chamber of Tutankhamen's tomb at Luxor was opened.

Both from Mesopotamia and Egypt we now have abundant public records, business accounts, stories, poetry and private correspondence. We know that life, for prosperous and influential people in such cities as Babylon and the Egyptian Thebes, was already almost as refined and as luxurious as that of comfortable and prosperous people today. Such people lived an orderly and ceremonious life in beautiful and beautifully furnished and decorated houses, wore richly decorated clothing and lovely jewels; they had feasts and festivals, entertained one another with music and dancing, were waited upon by highly trained servants, were cared for by doctors and dentists. They did not travel very much or very far, but boating excursions were a common summer pleasure both on the Nile and on the Euphrates. The beast of burden was the ass; the horse was still used only in chariots for war and upon occasions of state. The mule was still novel and the camel, though it was known in Mesopotamia, had not been brought into Egypt. And there were few utensils of iron; copper and bronze remained the prevailing metals. Fine linen and cotton fabrics were known as well as wool. But there was no silk yet. Glass was known and beautifully coloured, but glass things were usually small. There was no clear glass and no optical use of glass. People had gold stoppings in their teeth but no spectacles on their noses.

—H. G. Wells: *A Short History of the World.*

February 18, 1564.—Galileo Galilei the great Italian physicist and astronomer, was born.

I esteem myself fortunate to have found so great an ally in the search for truth. It is truly lamentable, that there are so few who strive for the true and are ready to turn away from wrong ways of philosophizing. But here is no place for bewailing the pitifulness of our times, instead of wishing you success in your splendid investigations. I do this the more gladly, since I have been for many years an adherent of the Copernican theory. It explains to me the cause of many phenomena which under the generally accepted theory are quite unintelligible. I have collected many arguments for refuting the latter, but I do not venture to bring them to publication.

—Galileo: *Letter to Kepler*, 1597.

February 21, 1888.—George Henry Corliss died. He invented the Corliss engine, one of the outstanding steps in the development of the modern steam engine.

Corliss invented a valve that worked like a revolving door; a rotary valve. He used these revolving-door valves at each end of the cylinder, one to admit the steam, and one to control the exhaust. A slight motion of one of these valves was sufficient to open or close the steam port or doorway almost without friction. To open and close his rotary valve, or revolving steam-door, automatically, Corliss invented a governor which was apparently composed of "endless jimcracks all precarious." By a system of parts, certainly more complicated than the simple ball-governor and sleeve of Watt, a weight was made to drop and suddenly cut off the steam as it entered the cylinder and not, as in the Watt engine, some moments later . . . . Finding it difficult to convince business men that his engine was any better than Watt's Corliss had to take risks in selling it. He knew his engine would save coal, and therefore he adopted . . . . the plan of installing an engine free of charge and of receiving in payment part of the money saved in coal. He sold one of his first engines with the understanding that he was to be paid all the money it saved in five years. At the end of five years he had pocketed $19,734.22—several times what the engine was really worth.

—Decker and Kaempffert: *A Popular History of American Invention.*

Science News-Letter, February 12, 1927

HYGIENE

Flu Epidemic Waning?

That the wave of influenza that has been sweeping over Europe is settling down before it touches our shores is the conclusion reached by officials of the U. S. Public Health Service based upon failure to receive further information on the progress of the epidemic. Both the Epidemiological Intelligence Department of the League of Nations and the Health Organization in England announced their intention ten days ago of broadcasting radio reports on the character and progress of the disease. Up to date, however, no reports have been picked up, says Surgeon General Hugh S. Cumming.

The fact that the Arlington Naval Wireless Station has been unable to pick up any of the signals for the Public Health Service is interpreted as meaning that the epidemic is subsiding and that no bulletins have been sent out from the European stations.

The decision of the health section of the League of Nations to make available by broadcasting the information received by extensive epidemiological intelligence section it has been building up, was determined, it is said, by the numerous inquiries received from all over Europe as well as Australia and the United States.

Science News-Letter, February 12, 1927

Mars has two moons, one of which rises in the east and the other in the west.

Bridges to enable pedestrians to cross busy streets have been proposed for Paris.

Houses as tall as five stories have been unearthed at Ostia, the harbor town of ancient Rome.

ARCHÆOLOGY

New Stone Age Venus

First details have been announced regarding a little statuette of a woman carved by some prehistoric artist of the Old Stone Age, which was found near Vienna last September. The headless little stone figure is pronounced a relic of the Aurignacian period of the Old Stone Age, which would make it 25,000 years old, or possibly older.

The statuette was found at Willendorf, near the left bank of the Danube River, and is the second such carving to be found in that region.

Cave man artists of Europe apparently liked to carve these small female figures, which today are called Stone Age Venuses. It is supposed that the figures were used in magic rites or in some religious cult of the time. They are today regarded as objects of great rarity, though a number of them have been found in different countries of Europe.

The first Venus discovered at Willendorf was four inches high, round and very fat, especially at breast and hips. The new find is about ten inches tall, and much more slender. A complete description of the new Venus has not yet been reported.

Science News-Letter, February 12, 1927

EXPLORATION

Explorer Enters China

Ignoring the fighting spirit of the Chinese crowds and their antagonism towards foreigners, Dr. Sven Hedin, famous Swedish explorer, is calmly preparing to set out from Peking on a long expedition to the interior deserts of China. Reports received in this country state that by the end of April, Dr. Hedin's caravan of camels will plunge into the desert from Paoto, the terminal of the Western Chinese Railway.

In the first year of the expedition, the party will study chiefly the climate and geographical features of Mongolia, Chinese Turkestan and the province of Kansu in northwestern China. Weather records will be made from five stations during at least a year and a half, in order to analyze climatic conditions in the large desert belt of Central Asia.

This is Dr. Hedin's third venture into the interior of Central Asia. His first expedition, thirty years ago, was daring pioneer adventuring into a country wrapped in mystery and danger. His second expedition, in 1906, led him to the source of the Bramaputra River among mountains far in Tibet. Dr. Hedin is now sixty-one years old.

Science News-Letter, February 12, 1927